

WHAT IS CLAIMED IS:

1. A lithographic projection apparatus comprising:
  - a radiation system that provides a beam of radiation;
  - a substrate table that holds a substrate;
  - a plurality of patterning means for patterning a beam of radiation derived from the radiation system according to a desired pattern;
  - a projection system that projects the patterned beam onto a target portion of the substrate;
  - a radiation distribution device that distributes the radiation from the radiation system to the patterning means;
  - radiation distribution channels; and
  - a radiation detection system that measures intensity of the radiation associated with each of the patterning means,wherein the radiation distribution device directs the radiation from the radiation system to a plurality of the radiation distribution channels and the radiation distribution channels provide the beams of radiation to the patterning means.
2. A lithographic projection system according to claim 1, wherein the radiation detection system comprises a detector that sequentially detects radiation associated with each patterning means.
3. A lithographic projection system according to claim 2, wherein the detector moves across a portion of the radiation associated with each of the patterning means.
4. A lithographic projection system according to claim 2, further comprising a probe associated with the detector, wherein the detector is

substantially stationary and the probe moves across a portion of the radiation associated with each of the patterning means.

5. A lithographic projection system according to claim 1, wherein the radiation detection system comprises detectors wherein each is associated with each of the patterning means.

6. A lithographic projection system according to claim 1, wherein the radiation detection system detects radiation exiting the radiation distribution system.

7. A lithographic projection system according to claim 1, wherein the radiation detection system detects radiation exiting the distribution channel.

8. A lithographic projection system according to claim 1, wherein the detection system detects radiation between the patterning means and the projection system.

9. A lithographic projection system according to claim 1, wherein the detection system detects radiation exiting the projection system.

10. A lithographic projection apparatus according to claim 1, further comprising a compensation system that adjusts intensity of the radiation that is associated with at least one patterning means and that is projected by the projection system.

11. A lithographic projection apparatus according to claim 10, wherein the compensation system independently adjusts the intensity of the radiation associated with each of the patterning means.

12. A lithographic projection apparatus according to claim 10, wherein:

at least one of the patterning means is an array of individually controllable elements that can be set to impart a beam of radiation with a desired pattern in its cross-section;

each independently controllable element is set to one of a plurality of states during which a different proportion of the radiation is directed to the projection system; and

the compensation system adjusts the radiation by changing the settings for each of the individually controllable elements, such that the pattern of the radiation is maintained, while the intensity of the radiation changes.

13. A lithographic projection apparatus according to claim 12, further comprising a control system that updates the compensation system with previously detected and stored radiation intensity data when the radiation is projected onto a portion of the substrate, wherein the stored data is a measure of the intensity variation when the patterning means is set so that all the individually controllable elements are set to the same state.

14. A lithographic projection apparatus according to claim 10, wherein the compensation system comprises a radiation attenuator that attenuates the radiation that is associated with at least one patterning means and that is projected by the projection system.

15. A lithographic projection apparatus according to claim 10, wherein the compensation system adjusts the intensity of a portion of the radiation that is associated with at least one patterning means and that is projected by the projection system.

16. A lithographic projection apparatus according to claim 10, further comprising a control system that updates the compensation system with previously detected and stored radiation intensity data when the radiation is projected onto a portion of the substrate.

17. A lithographic projection apparatus according to claim 10, further comprising a control system that updates the compensation system with previously detected radiation intensity data when radiation is projected onto a portion of the substrate, wherein the previously detected radiation intensity data corresponds to data detected by the radiation detection system before a current operation that is stored in a storage medium.

18. A lithographic projection apparatus according to claim 10, wherein:

the radiation detection system detects variation in radiation intensity in at least one of the radiation distribution system and the radiation distribution channels for each of the patterning means; and

the compensation system is arranged to compensate for this variation in radiation intensity.

19. A lithographic projection apparatus according to claim 10, wherein:

the radiation detection system is arranged to detect variation in radiation intensity in the projection system for each of the patterning means; and

the compensation system is arranged to compensate for this variation in radiation intensity.

20. A method of calibrating the radiation intensity in a lithographic projection apparatus, comprising:

detecting intensity of radiation at any of a number of stages in a lithographic projection apparatus when a patterning means are such that individually controllable elements are set to a same state;

storing the radiation intensity data for any of the number of stages in a storage medium;

detecting the intensity of the radiation at the same stages in the lithographic projection apparatus while it is in use;

using a control system to compare the stored data with data acquired while the lithographic projection apparatus is in use; and

using a compensation system to adjust the intensity of the radiation in accordance with an output of the control system.

21. A device manufacturing method, comprising:

providing a substrate;

providing a projection beam of radiation using a radiation system;

using a plurality of patterning devices to pattern beams of radiation derived from the radiation system according to a desired pattern;

projecting the patterned beams of radiation onto a target portion of the substrate; and

using a radiation distribution device to distribute the radiation from the radiation system to the patterning means via a plurality of radiation distribution channels;

using a radiation detector to measure the radiation intensity in the radiation distribution channels.

22. A device manufacturing method, comprising:

- providing a substrate;
- providing a projection beam of radiation using a radiation system;
- using a plurality of patterning devices to pattern beams of radiation derived from the radiation system according to a desired pattern;
- projecting the patterned beams of radiation onto a target portion of the substrate; and
- using a radiation distribution device to distribute the radiation from the radiation system to the patterning device via a plurality of radiation distribution channels;
- using a radiation detector to measure the radiation intensity in the radiation distribution channels, the radiation detector outputting an intensity value for each of the radiation distribution channels; and
- compensating for any difference in the radiation intensity of the radiation distribution channels.